

We claim:

1. An optical disc comprising:
an optically writable label side on which marks are optically writable; and,
a plurality of tracks on the optically writable label side,
5 each track having written thereto a repeating pseudorandom series of marks.
2. The optical disc of claim 1, wherein at least one of the repeating
pseudorandom series of marks of each track has a number of the track encoded
therein.
3. The optical disc of claim 2, wherein the number of each track is digitally
10 encoded within the at least one of the pseudorandom series of marks of the
track.
4. The optical disc of claim 2, wherein the number of each track is encoded in
an analog manner within the at least one of the pseudorandom series of marks
of the track.
- 15 5. The optical disc of claim 1, wherein the marks that are optically writable on
the optically writable label side are written in accordance with at least one of a
phase-change, multiple-dye, and a multiple-dye phase-change approach.
6. The optical disc of claim 1, wherein the marks that are optically writable on
the optically writable label side are written using a first dye, and the repeating
20 pseudorandom series of marks on each track are written using a second dye
different than the first dye.
7. The optical disc of claim 1, wherein the marks that are optically writable on
the optically writable label side are written using a dye at a first amount for each
mark having a first reflectivity, and the repeating pseudorandom series of marks

on each track are written using the dye at a second amount for each mark different than the first amount and having a second reflectivity different than the first reflectivity.

5 8. The optical disc of claim 1, wherein the repeating pseudorandom series of marks is a maximal spread spectrum code.

9. The optical disc of claim 8, wherein the repeating pseudorandom series of marks has a maximal code length and is generated with an n-stage shift register generator having m number of taps.

10 10. The optical disc of claim 9, wherein the maximal code length of the repeating random series of marks is 31, and the repeating random series of marks is generated with a five-stage shift register generator.

11. The optical disc of claim 10, wherein five-stage shift register generator has two taps located at a second stage and at a fifth stage of the generator.

15 12. The optical disc of claim 10, wherein five-stage shift register generator has four taps located at a second stage, at a third stage, at a fourth stage, and at a fifth stage of the generator.

13. The optical disc of claim 10, wherein five-stage shift register generator has four taps located at a first stage, at a second stage, at a fourth stage, and at a fifth stage of the generator.

20 14. An optical disc comprising:
an optically writable label side on which marks are optically writable;
a plurality of tracks on the optically writable label side; and,
means for pseudorandomly encoding a number of each track on the track.

15. The optical disc of claim 14, where the means comprises a maximal spread spectrum code encoding the number of each track on the track.

16. A method comprising:

generating a pseudorandom code;

5 for each track of a plurality of tracks on an optically writable label side of an optical disc,

modulating the pseudorandom code by a number of the track; and,

writing the pseudorandom code as modulated by the number of the track around the track.

10 17. The method of claim 16, wherein generating the pseudorandom code comprises generating a maximal spread spectrum code.

18. The method of claim 16, wherein generating the pseudorandom code utilizing an n-stage shift register generator having m number of taps.

15 19. The method of claim 16, wherein modulating the pseudorandom code by the number of the track comprises multiplying the pseudorandom code by the number of the track.

20 20. The method of claim 16, wherein writing the pseudorandom code as modulated by the number of the track comprises writing the pseudorandom code as modulated by the number of the track with a dye particular to track number writing.

21. The method of claim 16, wherein writing the pseudorandom code as modulated by the number of the track comprises writing the pseudorandom code as modulated by the number of the track with a dye amount particular to track number writing.

22. A method comprising:

optically reading from a track on an optically readable label side of an optical disc a pseudorandom code as modulated by a number of the track; and,
demodulating the number of the track from the pseudorandom code as
5 modulated by the number of the track to obtain the number of the track.

23. The method of claim 22, further comprising correlating the pseudorandom code as modulated by the number of the track.

24. The method of claim 22, wherein correlating the pseudorandom code as modulated by the number of the track comprises:

10 autocorrelating the pseudorandom code as modulated by the number of the track from any phase-shifted replicated version thereof; and,
crosscorrelating the pseudorandom as modulated by the number of the track from any pseudorandom code as modulated by a number of a different track.

25. The method of claim 22, further comprising generating the pseudorandom
15 code.

26. The method of claim 25, wherein demodulating the number of the track from the pseudorandom code as modulated by the number of the track comprises multiplying the pseudorandom code as modulated by the number of the track with the pseudorandom code as generated.

20 27. A mass storage device:

an optical marking mechanism to at least optically read markings on a plurality of tracks of an optically readable label side of an optical disc, each track having a pseudorandom code encoded with a number of the track; and,
a mechanism to optically read the pseudorandom code encoded with a
25 number of a track and decode the number of the track therefrom to determine the number of the track.

28. The mass storage device of claim 27, wherein the mechanism comprises an n-stage shift register generator having m number of taps to generate the pseudorandom code as a maximal spread spectrum code having a maximal code length.

- 5 29. The mass storage device of claim 28, wherein the n-stage shift register generator has a tap on each of a plurality of stages of the shift register generator.

30. The mass storage device of claim 28, wherein the mechanism further comprises a correlator to correlate the pseudorandom code as encoded with the
10 number of the track.

31. The mass storage device of claim 30, wherein the correlator is a sliding frame correlator.

32. A mass storage device:

- 15 an optical marking mechanism to at least optically read markings on a plurality of tracks of an optically readable label side of an optical disc, each track having a pseudorandom code as encoded with a number of the track; and,
means for determining a number of a track by optically reading the pseudorandom code as encoded with the number of the track and decoding the number of the track therefrom.

- 20 33. The mass storage device of claim 32, wherein the means comprises:
an n-stage shift register generator having m number of taps to generate the pseudorandom code as a maximal spread spectrum code having a maximal code length; and,
a correlator to correlate the pseudorandom code as encoded with the
25 number of the track.

34. A method comprising:

providing an optical marking mechanism of a mass storage device that is capable of at least optically reading markings on a plurality of tracks of an optically readable label side of an optical disc inserted into the mass storage mechanism, each track having a pseudorandom code as encoded with a number of the track; and,

providing a mechanism capable of optically reading the pseudorandom code encoded with a number of a track and capable of decoding the number of the track therefrom to determine the number of the track.

35. The method of claim 34, wherein providing the mechanism comprises providing an n-stage shift register generator having m number of taps to generate the pseudorandom code as a maximal spread shift code having a maximal code length.

36. The method of claim 35, wherein providing the mechanism comprises providing a correlator capable of correlating the pseudorandom code as encoded with the number of the track.

37. An article of manufacture comprising:

a surface on which optically readable marks are writable; and,

one or more optically readable position-indicating pseudorandom marks

written on the surface.

38. The article of claim 37, wherein each pseudorandom mark has encoded therein position information of the mark on the surface.

39. The article of claim 38, wherein the position information of each pseudorandom mark comprises an x coordinate and a y coordinate of a location of the mark on the surface.

40. The article of claim 38, wherein the position information of each pseudorandom mark on the surface is digitally encoded within the mark.

41. The article of claim 38, wherein the position information of each pseudorandom mark on the surface is encoded in an analog manner within the
5 mark.

42. The article of claim 37, wherein the one or more pseudorandom marks is a maximal spread spectrum code.

43. A method comprising:
generating a pseudorandom code;
10 modulating the pseudorandom code by position information on an optically readable surface; and,
writing the pseudorandom code on the surface.

44. The method of claim 43, wherein generating the pseudorandom code comprises generating a maximal spread spectrum code.

15 45. A method comprising:
optically reading from an optically readable surface a pseudorandom code modulated by position information of the pseudorandom code; and,
demodulating the position information from the pseudorandom code to obtain the position information.

20 46. The method of claim 45, further comprising generating the pseudorandom code.

47. A device comprising:
an optical marking mechanism to at least optically read markings from an optically readable surface; and,

a mechanism to optically read a pseudorandom code encoded with position information of the pseudorandom code from the optically readable surface and to decode the position information therefrom to determine the position information.

- 5 48. The device of claim 47, wherein the mechanism comprises an n-stage shift register generator having m number of taps to generate the pseudorandom code as a maximal spread spectrum code having a maximal code length.